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ABSTRACT

Summaries are provided for 16 measures of school-based attitudes. All of the instruments are paper and pencil, self-report inventories. Some are designed for children 4-8 years of age; others are for students in grades 12-14. Each of the instruments is presented in the following format: Title, Description, Subjects, Response Mode, Scoring, and Comments. The 16 measures are: Survey of Study Habits and Attitudes; School Interest Inventory; The Student Opinion Poll II; School Morale Scale; Measures of School and Learning Attitudes; Attitudes Toward Education; Polittle Sentence Completion Test; Pictographic Self Rating Scale; Children's Attitudinal Range Indicator; When Do I Smile?; Attitude Toward Any School Subject; Attitude Instrument to Evaluate Student Attitudes Toward Science and Scientists; Inventory of Reading Attitude; A Childhood Attitude Inventory for Problem Solving; Mathematics Attitude Scale; and A Semantic Differential for Measuring Attitudes of Elementary School Children toward Mathematics. Fifteen references are provided. (DB)

An Omnibus of Measures Related to School-Based Attitude

Compiled by Joan Knapp

CENTER FOR STATEWIDE EDUCATIONAL ASSESSMENT
EDUCATIONAL TESTING SERVICE • PRINCETON, NEW JERSEY

AN OMNIBUS OF MEASURES RELATED TO SCHOOL-BASED ATTITUDES

Compiled by

Joan Knapp

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INTRODUCTION

The following summaries form a small sample drawn from a burgeoning corpus of literature concerning the measurement of school-based attitudes. These measures were selected to show the variety of instruments available. Some involve pictorial stimuli; others involve written statements. Some are projective in nature; others are more objective. Some are designed for children, ages 4-8; others for students in grades 12-14. Some have evolved through several decades of research; others have virtually no published data which would contribute to the evaluation of their soundness.

The amount and variety of these measures indicate that there is an increased interest in assessing students' attitudes. However, an examination of the following sample from the literature reveals that there are many closely related terms in this non-cognitive realm which prevent the educational researcher and evaluator from attaining a tight conceptualization of this area. Attitude can mean opinion, feelings, habit, self-concept. School can mean learning, study, education, teachers, or a particular subject such as mathematics.

For this reason, it is imperative that the education specialist clearly defines his goals and objectives in the affective-attitudinal domain before borrowing an instrument designed by others or before designing one himself. Such goals and objectives should be embedded in a larger conceptual scheme which includes other variables that are salient to his purpose and that add to the validity of his instrument. For example, an evaluation specialist may be interested in changes in attitudes toward mathematics on the junior high level. Depending on his purpose, interpretation of results on a student mathematics attitude questionnaire may involve measuring home environment variables, attitudes and training of teachers, the content and goals of various math curricula being used, etc. In other words, the self-report inventory can not be the 'be all' and 'end all' when attempting attitude assessment.

As varied as the following collection seems, all the instruments have one characteristic in common. They are all paper and pencil, self-report inventories and suffer from all the inherent disadvantages of this measurement technique. They are subject to malingering and faking on the part of the student. Response sets and styles may introduce much error in the measurement procedure. These possibilities serve to threaten the validity of attitude inventories. Attitudinal behavior as measured by questionnaires is more changeable over time than cognitive behavior as measured by tests of ability. This complicates the determination of reliability. Since most of the inventories involve reading and some involve writing, the student's ability to answer the items accurately is largely dependent on his or her verbal aptitude. This problem is particularly critical at the elementary school level.

For these reasons, self-report inventories should be supported by attitudinal data obtained from other measurement techniques such as observations, interviews, peer and teacher ratings, school records, etc.

As a final comment, much of the research in this area relies heavily on correlational techniques applied to these indirect somewhat crude measures of affective behavior. Not enough expertise has been directed to testing out hypotheses suggested by correlational research. If the educator's goal is to change cognitive and affective behavior, then more sophisticated research and assessment is needed to discover techniques for developing positive attitudes and modifying negative attitudes.

Title: Survey of Study Habits and Attitudes

Description: The SSHA is a 100 item instrument developed by Brown Holtzman (1955) with three purposes in mind. They are 1) to identify students whose study habits and attitudes are different from those of students who earn high grades 2) to aid in understanding students with academic difficulties, and 3) to provide a basis for helping such students improve their study habits. The current Form C (Grades 12-14) and Form H (Grades 7-12) are based upon eight years of research and development. The authors claim that the instrument has four subscales--delay avoidance, work methods, teacher approval, educational acceptance.

Examples:
1. I lose interest in my studies after the first few days of a semester.
2. When I am having difficulty with my school work, I try to talk over the trouble with the teacher.

Subjects: The instrument, both forms, has been validated and tested on thousands of college and secondary school students. For example, Form H was normed on a total of 11,218 students in 16 different towns and metropolitan areas across the United States.

Response Mode: For each item the student blackens one space out of five, marked R, S, F, G, A which correspond to rarely, sometimes, frequently, generally, almost always.

Scoring: The alternatives are scored from 5 (almost always) to 1 (rarely) for positively phrased items. Weights for negatively phrased items are reversed. The students score is the sum of the weights for alternatives endorsed by him. High scores indicate more positive attitudes and habits. In addition, subscores can be obtained for counseling purposes.

Comments: The SSHA has been used in many research studies and it has been reviewed in Buros' Mental Measurement Yearbook. The subscales were derived empirically; whereas most instruments of this type have somewhat weaker subscales derived rationally. SSHA is published complete with manual by the Psychological Corporation.

Title: School Interest Inventory

Description: This instrument was designed to identify potential dropouts (Cottle,1961). It consists of 150 statements. Items which consistently differentiated between dropouts and stay-ins were selected from an item pool to form the present inventory.

Examples:
1. I like school.
2. I skip school at least once a month.
3. I have been absent from school more than 20 days last year.

Subjects: The instrument has been administered to 25,000 students in ten states after being validated on a matched sample of 1,300 dropouts and 1,300 stay-ins. For maximum usefulness the inventory should be administered to junior high school students.

Response Mode: Subjects are asked to fill in circle containing "T" if the item is true for him; fill in circle containing "F" if item is false.

Scoring: Unweighted and weighted scores can be determined, with an absolute unweighted raw score of 30 suggested as a cutting score above which students might be considered dropouts. Of the items, 75 are scored for both males and females, 15 for just males, 11 for just females, and 49 of the items have no function in determining a subject's score.

Comments: The items are transparent, thus promoting faking. Those items which receive the greatest weights are the most obvious. The predictive strength of this measure has not been compared to the strength of attendance records, grades, or teacher opinion. The inventory is published by Houghton Mifflin Co.

Title: The Student Opinion Poll II

Description: This is a revision of a questionnaire developed by Jackson & Getzels (1959) and used by Jackson and Lahaderne (1967) in a study of 300 sixth grade students in a working class suburb. Its intent was to elicit responses concerning general satisfaction or dissatisfaction with four aspects of school life: the teachers, the curriculum, the student body, and classroom procedures. This version contains 47 mutiple choice items.

Example: The things that I am asked to study are of:
a. great interest to me.
b. average interest to me.
c. little interest to me.
d. no interest to me.

Subjects: Various versions of this inventory have been used in research studies involving private and public; urban and suburban; and junior and senior high school students. Adaptions would have to be made for students with poor reading skills.

Response Mode: A student indicates his response by circling the choice which best completes the item stem.

Scoring: The questionnaire is scored by giving one point each time the subject chose from within a set of multiple choices the response indicating the highest degree of satisfaction with that aspect of school life. Thus, the possible range of scores was from 0 to 47.

Comments: When used in research studies, student scores on the instrument showed no relationship to the scholastic performance of the students; however this does not mean that the instrument can not be used to assess the effect on school attitude of an innovative educational program.

Title: School Morale Scale

Description: The School Morale Scale (Wrightsman, Nelson, and Taranto, 1968) is an 84 item scale which measures seven aspects of a student's morale about school. These aspects ranged from morale about school plant to general feeling about attending school. Several persons independently composed statements for subscales. A total of 150 items were obtained and were reduced to 12 items for each of the seven subscales.

Examples:
1. This building is old and run-down.
2. All my teachers know me by name.
3. The principal of this school is very fair.

Subjects: The sample upon which the scale was constructed was 127 5th graders from public elementary schools in a small city in Tennessee, 169 7th graders from a junior high school in a large city in Tennessee, and 137 9th graders from the same junior high school. It has been administered to 5th and 6th graders in Alabama.

Response Mode: Subjects respond by marking items with which they agree with an "A"; items for which they disagree with a "D".

Scoring: Each subscale is scored with a total of 12 indicating good morale in regard to that aspect. The scores for the seven subscales are summed to give a total score which ranges from 0-84.

Comments: Reliability and validity information can be obtained from authors at George Peabody College for Teachers. It is not clear that subscales are justified. The reading level of the items may prove difficult for elementary students.

Title: Measures of School and Learning Attitudes

Description: These two measures (25 items each), Attitude Toward School and Attitude Toward Learning were developed by Roshal, Frieze, and Wood (1971) for a study in which they hoped to validate these measures using the Campbell and Fiske multitrait-multimethod method. They hypothesized that attitudes toward school and learning were two separate but similar dimensions with attitude toward school being feelings about school, teachers, subjects, classmates, etc. and attitudes toward learning being concerned with the student's general interest in the world, reading, and learning activities. A third scale, Attitude Toward Technology, was devised to prove that the other two dimensions were quite different from the third.

Large numbers of items were constructed on the basis of content validity (items believed by educational specialists to measure the respective attitude) for each of the three scales. After several preliminary item analyses studies, which utilized factor analyses and item-total correlations, the final versions were constructed. Both positively and negatively worded items were used to control for response bias.

Examples: ATTITUDE TOWARD SCHOOL

1. I
   a. always
   b. usually
   c. sometimes hate school
   d. rarely
   e. never

2. Teachers in this school are
   a. always
   b. usually
   c. sometimes friendly.
   d. rarely
   e. never

ATTITUDE TOWARD LEARNING

1. School subjects are
   a. always
   b. usually
   c. sometimes boring.
   d. rarely
   e. never

2.

Whenever I go on a trip, I learn
a. lots of
b. many
c. some new things.
d. a few
e. no

ATTITUDE TOWARD TECHNOLOGY

1.
a. strongly agree
b. agree
I c. partly agree, partly disagree that most new inventions
d. disagree help people live better.
e. strongly disagree

2.

I could
a. always
b. usually
c. sometimes learn how to fix almost anything.
d. rarely
e. never

Subjects: The three scales, ATS, ATL, and ATT, were administered along with other questionnaires and peer ratings to a sample of 610 sixth grade students in 13 public schools. Their average Lorge Thorndike verbal IQ was 101.4 with a standard deviation of 15.7. There were approximately equal numbers of boys and girls. The sample ranged from lower middle to lower upper class in socioeconomic status (as judged by school district personnel).

Response Mode: The student circles the option that best completes the statement according to his own feelings.

Scoring: Information not available

Comments: ATS, which measures the student's general attitude towards school as an institution, might be used by educators to measure feelings about school. It is probably relatively sensitive to attitude changes (although further studies of this are needed). The results of the Roshal study does give support for the independence of the two instruments even though both teachers and researchers have some difficulty differentiating the two concepts. ATL, which indicates a more general orientation toward learning, probably does reflect more of a personality trait than does ATS and thus may not be as susceptible to short term changes as are attitudes toward school.

Both scales may be administered independently or in combination for elementary school assessment. They are presently being used with children in third through fifth grades as well as with children in the sixth grade. Although the reading difficulty of words used on the scales was purposefully kept low, use with average readers below the fifth grade is not recommended, however, unless the items are read aloud. Normative data for sixth grade pupils are available from the authors.

Title: Attitudes Toward Education

Description: This is a 34 item, Thurstone type scale developed by Glassey (1945) to measure attitudes toward the value of education and the effects of education upon people. There are enough items in the scale to create several shorter equivalent forms.

Examples:
1. We cannot become good citizens unless we are educated.
2. Too much money is spent on education.
3. Education does more harm than good.

Subjects: Approximately 300 British grammar school children, ages 11-18 and their parents were used to construct the scale. Forty judges were used to sort the items for determining scale values.

Response Mode: A student checks those items with which he fully agrees and places a cross in front of those items with which he does not fully agree. He may place a question mark in front of the item if he is totally unable to decide.

Scoring: The student's score is the median of the scale values of the items endorsed as 'fully agree'. Low scores indicate positive attitudes toward education.

Comments: Despite the fact it was developed on British students, the language of the items seems satisfactory for use with American samples. The scale has the advantage that it may be used with a wide range of ages and educational levels. It would appear to be most useful in identifying potential dropouts as it seems to tap a feeling of alienation from the educative process.

Title: Politte Sentence Completion Test

Description: The Politte Sentence Completion Test (PSCT) is a projective psychological test instrument for eliciting personality data on the examinee. Thirty-five sentence stems are used. It can serve as an addition to other diagnostic and evaluative instruments used in personality assessment in the educational, counseling, and clinical areas. Ten of the items refer to attitudes toward school and school adjustment. It can be used in a 1:1 setting or in a group setting. Little training is required by examiners in order to administer the test; however, only qualified school or clinical psychologists should attempt to interpret the test due to the projective quality involved.

Examples: 1. What bothers me at school is_____.
2. School would be better if_____.

Subjects: The PSCT is designed for use with school children grades 7 through 12, and can be used with older subjects who are functioning at this school level. The instrument was not designed with the use of a sample; therefore typical instrument construction data are not available.

Response Mode: Students are to complete each stem in any way that they feel about the item.

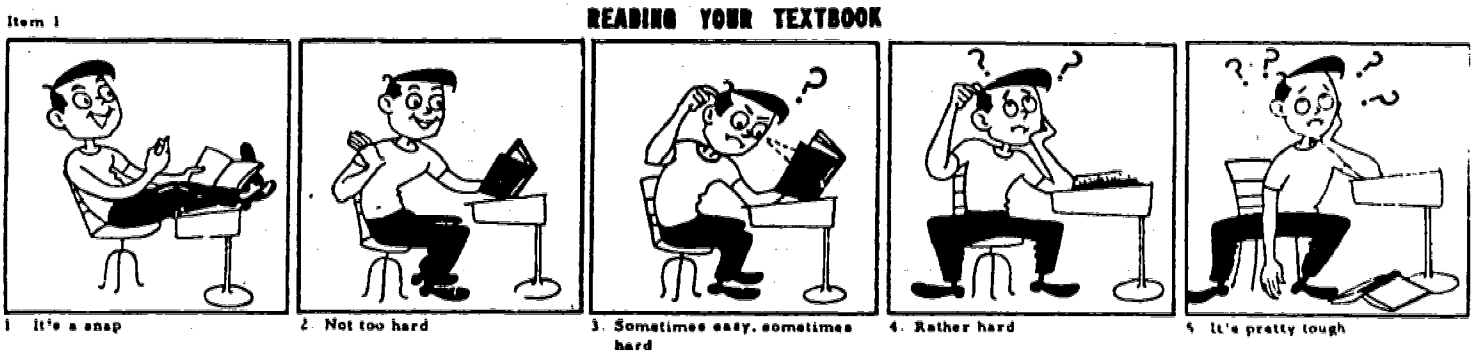
Scoring: The PSCT is not scored objectively. It can be analyzed subjectively through the use of psychodiagnostic theories involving projective techniques. Persons without training in clinical psychology should use the PSCT as a screening instrument to aid in the interview or counseling setting. Clinically trained psychologists can additionally base their interpretations from a psychoanalytic, social, behavioral or similar approach.

Comments: The subject's response to the items are dependent on his written verbal aptitude. Because of the projective nature of the instrument, it is probably appropriate for individual counseling and would not be useful in a large group assessment situation. The test is published by Psychologists and Educators Inc., Jacksonville, Illinois.

Title: Pictographic Self Rating Scale

Description: The PSRS is a 15 item test which was designed to allow pupils to take an active part in the analysis of his progress in any school subject. The items represent various aspects of the subject being taught. Each item is accompanied by a series of 5 cartoon-like pictures showing a student in various situations with captions beneath.

Example:



Subjects: A validation study has been undertaken on 202 high school students in Northeastern Indiana high schools. The author recommends its use on students in secondary school or college.

Response Mode: The student circles the number on a separate answer sheet corresponding to the picture which best depicts his feeling about the topic.

Scoring: The total score gives an indication of the student's overall attitude toward the subject and classroom activity. The answer sheet has numbers and subscripted numbers. To find the total score, the circled numbers of all even-numbered items are added to the subscripted numbers of all odd-numbered items.

Comments: The instrument might insult the mature student with its juvenile approach. The situations in pictures are somewhat dated. Data from black students and female students will probably not be valid as pictures represent the middle-class, white male. The scale as well as the answer sheet are confusing and the layout is poor.

Title: Children's Attitudinal Range Indicator

Description: This instrument is one of a battery of measures designed to assist in the study of personality factors and their relationship to achievement. They were developed particularly for preschool and early elementary students who might be characterized as culturally different (Cicirelli et al, 1971).

The Children's Attitudinal Range Indicator (CARI) was designed to assess the child's positive and negative attitudes toward peers, home, school, and society. In attempting to assess attitudes of the primary school child, the usual methods of attitude measurement are not applicable because young children often cannot or will not verbalize. With this in mind, a semi-projective device was developed.

The projective feature of the CARI consists of presenting unstructured and incomplete picture-stories in three "frames," with a fourth frame containing three stylized conventional faces depicting happy, neutral, or sad feeling-tone. By having the subject indicate how each story should end, the CARI invites his identification with the character of a particular frame series, his investment of self in the situation presented, a projection of his own thinking, feeling, and judgment to determine the outcome. Thus, for example, a given item presents three frames showing Bobby on his way to school, approaching the building, and going inside; the subject is then required to choose which of the three faces is Bobby's. In being asked to identify himself with Bobby, the child presumably projects himself into this situation and chooses the response for Bobby which reveals his own attitude towards school.

The CARI consists of eight picture-stories in each of four areas (school, home, peers, and society), making a total of 32 items.

Examples: 1. (Peers) Sally is at school. A new girl comes to the class. At recess, the new girl comes over to talk to Sally. Which one is Sally's face?

2. (School) Bobby is on his way to school. He gets to school. He opens the door and goes inside. Which one is Bobby's face?

Subjects: Appoximately 150 lower and middle class, second grade pupils were used to determine the validity and reliability of the instrument. The pictorial content of the test makes it suitable for students K-3.

Response Mode: Students are to circle the face that indicates how the story should end.

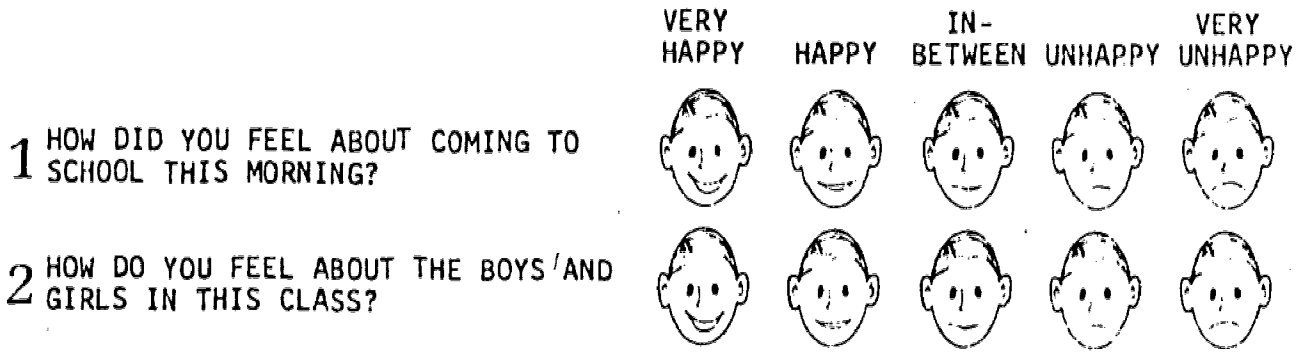
Scoring: Response alternatives to each of the items in the CARI are scored from one to three points; three reflects a more positive attitude, two a neutral attitude, and one a negative attitude. Subscores (ranging from eight to 24) for attitudes towards peers, school, home, and society are obtained by adding the scores on each of the eight items representing a particular area.

Comments: Scores on the CARI were obtained in connection with a nation-wide evaluation of Head Start centers, however, there is nothing to indicate that it cannot be used with any preschool or early elementary school pupil. In addition, due to the semi-projective nature of the items, the children taking the test exhibited many spontaneous responses which threatens to lower the reliability and validity of the instrument.

Title: When Do I Smile?

Description: This 23 item inventory was developed by American Institutes for Research to be used as one method of evaluating the attitudinal variables involved in a special innovative program in a school system in Florida. It was hoped that the pupils in the program would develop more positive and realistic attitudes toward themselves and the world. Approximately 14 items out of the total inventory concern the students' feelings toward school. Each item is accompanied by five faces depicting a range from 'very happy' to 'very unhappy'. Two forms were developed--a Grades 1-3 form and a Grades 3-5 form.

Example from Grades 3-5 form:



Subjects: The scale was administered to 1616 students in grades 1-5 who participated in the project. Developed specifically to assist in this program's evaluation, it has not been used in other situations or locations.

Response Mode: The Grades 1-3 form is designed to be administered orally to students. Their responses require an 'X' mark on the face which corresponds to the way they feel about various questions. The Grades 3-5 form varies little in the wording of items from the Grades 1-3 form. The students are reqired to read the items themselves and put an 'X' on the face which depicts their feeling about each them.

Scoring: The faces for each item represent a score range of 1-5 with 5 being 'very happy'. Total score is obtained by adding the score for each item. In the program's evaluation, the inventory was administered at the onset of the program and at the end of the program and at the end of the school year to obtain difference scores in order to ascertain whether there was improvement, impairment, or no change in attitudes.

Comments: The researchers involved in the instrument development admit that much more research and development is needed if it is to be used in other evaluations. They feel that any self report inventory for children of these ages is quite sensitive to differences in administration, perceived social and economic status, etc. In addition the instrument may appear juvenile to the mature fifth grader.

Title: Attitude Toward Any School Subject

Description: This 45 item, Thurstone type scale was developed by Silance and Remmers (1934). Two equivalent forms were developed which add to its usefulness for research purposes. The inventory can be used by substituting the name of the subject under study for 'this subject' in each item.

Examples:
1. This subject fascinates me
2. My parents never had this subject; so I see no merit in it
3. This subject does not teach you to think.

Subjects: The exact populations and samples upon which the scale was constructed is uncertain, but it was apparently developed upon a sample involving several thousand high school students and college undergraduates.

Response Mode: Students check those items with which they agree.

Scoring: The individual student's score is the median of the scale values (previously determined by construction sample) of the items endorsed by the student.

Comments: Even though it was developed almost 40 years ago, this scale has been used widely up to the present in a variety of research projects. Measurement specialists feel that it is reasonably valid and reliable; however, the reading level is probably too high for a poor junior or senior high reader and the terms used in some items are somewhat dated (e.g., fogy, bunk, hate it like the plague).

Title: Attitude Instrument to Evaluate Student Attitudes toward Science and Scientists.

Description: This instrument was designed by Mots (1972) to determine the attitudes of sixth and ninth grade rural, urban and suburban students toward science and scientists. The attitude instrument was based upon a grid of key statements about science and scientists. Part I of the instrument consisted of statements about science, Part II about scientists.

Ideas and statements about science and scientists were obtained by questioning 525 elementary, secondary and college students, plus scientists and science educators. The final form of the instrument resulted after extensive trial administrations for readability and understanding of the attitude statements. The instrument was validated by a jury panel of twenty professional scientists and science educators.

Subjects: The instrument was administered to a sample consisting of 981 male and female, sixth and ninth grade students from rural, urban and suburban communities in Michigan.

Response Mode: Information not available

Scoring: Information not available

Comments: Although instrument was deisgned for a particular school system in Michigan, the care taken in its construction may have resulted in an instrument which could be used in other locations. Validity studies and replication would add to its usefulness.

Title: Inventory of Reading Attitude

Description: A 25 item instrument which attempts to assess a student's attitude toward reading in school as well as reading in free time outside of the school context.

Example:
1. Do you think that most things are more fun than reading?
2. Do you like to read aloud for other children at your school.

Subjects: The sample upon which the scale was originally constructed is unknown, but it has been used with elementary school children to assess the development of favorable attitudes in children toward reading as result of various methods of instruction. (Dubois, 1971)

Response Mode: The students read each item or the items are read to the student. The student checks "yes" or "no" to each question.

Scoring: Information not available

Comments: The items are written simply and geared for young children. They are probably too transparent for the older child who identifies "liking reading" as a socially desirable attribute.

Title: A Childhood Attitude Inventory For Problem Solving

Description: The Childhood Attitude Inventory For Problem Solving (CAPS) is part of a larger effort to develop an omnibus set of instruments to assess problem-solving competency among upper elementary school children (Covington, 1966). CAPS is a group-administered paper-pencil inventory consisting of two 30-item scales. Scale I, which assesses the student's beliefs about the nature of the problem-solving process, treats a number of themes, including the child's conception of the innateness of problem-solving ability. ScaleII, which assesses the child's degree of self-confidence in dealing with problem-solving tasks, reflects some of the typical sources of childhood anxiety about thinking, including the fear of having one's ideas held up for ridicule.

Subjects: A preliminary form was administered to 190 5th and 6th grade students. The present form was administered to 325 additional subjects.

Response Mode: Information not available

Scoring: Information not available

Comments: The author claims that CAPS holds promise as a useful tool for investigating the relationship between problem-solving attitudes and various kinds of learner characteristics. Other research exploring the relationship between expressed attitudes toward problem-solving and actual problem-solving performance is now being conducted.

Title: Mathematics Attitude Scale

Description: This instrument is a 20 item scale developed by Aiken (1972) using Likert's method of summated ratings. The items were derived from paragraphs written by 310 college students. Ten of the items connote positive attitudes, ten negative attitudes.

Examples:
1. Mathematics is fascinating and fun.
2. It makes me nervous to even think about having to do a math problem.

Subjects: Versions of this scale have been used with sixth graders, junior and senior high school students, and college undergraduates and graduate students. Validity estimates were based on a sample of 160 female college sophomores.

Response Mode: The student is to indicate using five alternatives ranging from "strongly disagree' to 'strongly agree' the extent of agreement between the attitude expressed in each statement and his own personal feeling. There is an alternative for 'undecided'.

Scoring: The alternatives for positive items are weighted 4 (strongly agree) to 0 (strongly disagree). These weights must be reversed for negative items. The student's score is the sum of weighted alternatives endorsed by him. High scores reflect positive attitudes.

Comments: The instrument has been used by Aiken and others in extensive investigations concerning attitudes and achievement in mathematics. Other variables are included in the studies (e.g., age, sex, SES). The studies reveal that the validity and reliability of this scale vary somewhat with grade level, being generally more psychometrically sound in high school and college. This may be due to two reasons: 1) attitudes become more stable with maturity and 2) the degree of self-insight and conscientiousness with which students can express their attitudes increases with age.

Title: A Semantic Differential for Measuring Attitudes of Elementary School Children Toward Mathematics

Description: This particular instrument was developed by Scharf (1971); however the Semantic Differential can be adapted to a wide variety of attitudinal studies. The subject is asked to indicate his association of a given concept using a series of bi-polar word pairs, or antonyms, such as Good versus Bad. Working fairly rapidly to heighten affective response and minimize cognitive response, the subject checks one of the positions on the scale between the pair of bi-polar adjectives. The result of the checking operation is a series of ratings on the given concept along each scale. The same set of scales is used in rating all the concepts in the instrument. An example from one of the items used in the instrument is shown below.

Example:

TAKING A MATH TEST IS

	very	: sort of	: neither	: sort of	: very	
BAD	_____	: _____	: _____	: _____	: _____	GOOD
HAPPY	_____	: _____	: _____	: _____	: _____	SAD

A student with a negative attitude toward "Taking a Math Test" might rate it as: Very BAD and Sort of SAD.

The number of concepts to be included in a particular instrument is limited only by factors of relevance and time constraints. The following concepts were included among those chosen for the instrument.

1. My Math Class is
2. Doing Math is
3. Taking a Math Test is

The student's attitude toward the study of mathematics can thus be broken down into a number of component parts, all of which might be affected, in some way, by his experiences in mathematics.

Subjects: The instrument was administered in 1969 to 4th, 5th, and 6th grade students in four schools in which students had been exposed to an individually prescribed math instruction program for 3 years and in four control schools where traditional math was taught. A total of 1304 students responded to the attitude measure.

Response Mode: See above.

Scoring: The direction of the student's attitude toward a particular concept, favorable or unfavorable, is indicated by his judgments within the polar terms. The intensity of the attitude is indicated by how far out the score lies from the midpoint; that is, a student could respond that "Taking a Math Test is" very Good or sort of Good, and the first response would indicate a more intense and positive attitude toward the concept than would the second. A total score can be obtained by adding up scores on the particular concepts. However, there is some question as to how meaningful this total score is.

Comments: The scales are relatively easy to construct and analyze. Such an instrument represents an attempt to construct items for attitude measurement that are comprehensible and yet are not transparent to young children.

References

Aiken, L.R. Research on attitudes toward mathematics. Arithmetic Teacher, 1972, 14, 229-234.

Brown, W.F. and Holtzman, W.H. A study attitudes questionnaire for predicting academic success. Journal of Educational Psychology, 1955, 46, 75-84.

Cicirelli, V.G. et al. Measures of self-concept, attitudes, and achievement motivation of primary grade children. Journal of School Psychology, 1971, 9, 383-392.

Cottle, W.C. The school interest inventory. Psychological Reports, 1961, 9, 66.

Covington, M.V. New directions in the appraisal of creative thinking potential. University of California, Berkeley. Mimeographed, 1966.

Dubois, J. A comparison of reading attitude between first grade reading instruction in i/t/a and t/o. Contemporary Education, 1971, 42, 169-172.

Farr, R., Laffey, J. and Smith, C. Inventory of reading attitude. In Taxonomy of evaluation techniques for reading programs. Indiana University, August, 1968.

Glassey, W. The attitude of grammar school pupils and their parents to education, religion, and sport. British Journal of Educational Psychology, 1945, 15, 101-104.

Jackson, P.W., and Getzels, J.W. Psychological health and classroom functioning: A study of dissatisfaction with school among adolescents. Journal of Educational Psychology, 1959, 50, 295-300.

Jackson, P.W. and Lahaderne, H.M. Scholastic success and attitude toward school in a population of sixth graders. Journal of Educational Psychology, 1967, 58, 15-18.

Mots, L.L. The development of an instrument to evaluate sixth and ninth grade students' attitudes toward science and scientists. Proceedings of 45th annual meeting of National Association for Research in Science Teaching. Chicago, Illinois, April, 1972.

Roshal, S.M., Frieze, I. and Wood, J.T. A multitrait-multimethod validation of measures of student attitudes toward school learning and toward technology in sixth grade children. Educational and Psychological Measurement, 1971, 31, 999-106.

Scharf, E.S. The use of the semantic differential in measuring attitudes of elementary school children toward mathematics. School Science and Mathematics, 1971, 71, 641-649.

Silance, E.B. and Remmers, H.H. An experimental generalized master scale: A scale to measure attitude toward any school subject. Purdue University Studies of Higher Education, 1934, 35, 84-88.

Wrightsman, L.S., Nelson, R.H. and Taranto, M. The construction and validation of a scale to measure children's school morale. Paper presented at American Educational Research Association Convention, Chicago, February, 1968.